

ABSTRACT OF THE DISCLOSURE

Feedback timing control equipment and process for an injection seeded modular gas discharge laser. A preferred embodiment is a system capable of producing high quality pulsed laser beams at pulse rates of about 4,000 Hz or greater and at pulse energies of about 5 to 10 mJ or greater for integrated outputs of about 20 to 40 Watts or greater. The feedback timing control is programmed to permit in some circumstances discharges timed so that no significant laser energy is output from the system. Use of this technique permits burst mode operation in which the first discharge of a burst is a no-output discharge so that timing parameters for each of the two chambers can be monitored before the first laser output pulse of the burst. Two separate discharge chambers are provided, one of which is a part of a master oscillator producing a very narrow band seed beam which is amplified in the second discharge chamber. The chambers can be controlled separately permitting optimization of wavelength parameters in the master oscillator and optimization of pulse energy parameters in the amplifying chamber.